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APPLICATION NUMBER: ***63/761,171***
FILING DATE: ***February 21, 2025***

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US ***63/761,171***

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

Rodney Glover

Rodney Glover
Certifying Officer

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
63/761,171	**02/21/2025 02:02:20 AM Z ET**	-

Title of Invention

Space Capable Autonomous Robotic Explorer

Application Information

APPLICATION TYPE	Utility - Provisional Application under 35 USC 111(b)	PATENT #	-
CONFIRMATION #	4003	FILED BY	Charles Faires
PATENT CENTER #	69276823	FILING DATE	-
CUSTOMER #	–	FIRST NAMED INVENTOR	Mickael Laine
CORRESPONDENCE ADDRESS	Charles Wesley Faires 2065 Country Ridge Road Milton, GA 30004 US	AUTHORIZED BY	-

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
generatedADS69276823.pdf	5	Application Data Sheet	113 KB
sb0016-cover-sheet.pdf	3	Provisional Cover Sheet (SB16)	483 KB

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specification-SPEC.docx	7	Specification	13 KB

Warning: One or more pages are missing page numbering. Page numbering will be automatically applied after submission. The margins of the attached document do not meet USPTO rules. This may cause processing errors or delays.

drawings-DRW.docx	8	Drawings-only black and white line drawings	1764 KB

Warning: The automatic document description has been replaced. The margins of the attached document do not meet USPTO rules. This may cause processing errors or delays.

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/16 (01-25)
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 1 of 2

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Priority Mail Express® Label No. _____

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Mickael	Laine	Sendai, Japan

Additional inventors are being named on the _____ separately numbered sheets attached hereto.

TITLE OF THE INVENTION (500 characters max):

Space Capable Autonomous Robotic Explorer

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

☐ The address corresponding to Customer Number:

OR

☑ Firm or Individual Name Charles Wesley Faires

Address 2065 Country Ridge Road

City Milton	State GA	Zip 30004
Country USA	Telephone 14044094468	Email w.faires@asteroidminingcorporation.co.uk

ENCLOSED APPLICATION PARTS (*check all that apply*)

- ■ Application Data Sheet. See 37 CFR 1.76.
- ☑ Drawing(s) *Number of Sheets* 8
- ☑ Specification (e.g., description of the invention) *Number of Pages* 7
- ☐ CD(s), Number of CDs _____
- ☐ Other (specify) _____

Fees Due: Filing Fee of $325 ($130 for small entity) ($65 for micro entity). If the specification and drawings exceed 100 sheets of paper, an application size fee is also due, which is $450 ($180 for small entity) ($90 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

METHOD OF PAYMENT OF THE FILING FEE AND APPLICATION SIZE FEE FOR THIS PROVISIONAL APPLICATION FOR PATENT

- ☑ Applicant asserts small entity status. See 37 CFR 1.27.
- ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
- ☐ A check or money order made payable to the *Director of the United States Patent and Trademark Office* is enclosed to cover the filing fee and application size fee (if applicable).
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 2 of 2

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government. (NOTE: Providing this information on a provisional cover sheet, such as this Provisional Application for Patent Cover Sheet (Form PTO/SB/16), does not satisfy the requirement of 35 U.S.C. 202(c)(6), which requires that the *specification* contain a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.)

☑ No.

☐ Yes, the invention was made by an agency of the U.S. Government. The U.S. Government agency name is:

_____

☐ Yes, the invention was made under a contract with an agency of the U.S. Government.

The contract number is: _____

The U.S. Government agency name is: _____

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In accordance with 35 U.S.C. 202(c)(6) and 37 CFR 401.14(f)(4), the specifications of any United States patent applications and any patent issuing thereon covering the invention, including the enclosed provisional application, must state the following:

"This invention was made with government support under [IDENTIFY THE CONTRACT] awarded by [IDENTIFY THE FEDERAL AGENCY]. The government has certain rights in the invention."

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SIGNATURE /Charles Wesley Faires/ DATE 2024-02-21

TYPED OR PRINTED NAME Charles Wesley Faires REGISTRATION NO. _____ (*if appropriate*)

TELEPHONE 14044094468 DOCKET NUMBER _____

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8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));

9) the Office of Personnel Management (OPM) for personnel research purposes; and

10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Utility Patent Application (Provisional)

TITLE: SPACE CAPABLE AUTONOMOUS ROBOTIC EXPLORER

Inventors: Mickael Laine

FIELD OF INVENTION

[0001] SCAR-E's design is rooted in innovations and principles developed for space exploration, having been designed from the outset to survive the rigours of extended operations in space and to face the unique challenges of carrying out targeted locomotion in microgravity environments. As well as being designed with focus on autonomous operations in GPS-denied environments, SCAR-E is designed with space environments in mind and to withstand dust and debris. Use of aerospace grade materials to minimise weight for launch but maximise toughness allows for this robot size with a record low weight. Redundant components and large tolerances are built in due to the need to carry out extended autonomous operations in space without the possibility of maintenance.

BACKGROUND

[0002] AMC was founded to build out the architecture to unlock the potential of asteroidal resources, starting with the technologies that have immediate commercial applications here on Earth.

[0003] For a sector with a long horizon, positioning is everything. We are creating the keystone robotic technologies that will enable asteroid mining tomorrow while providing an immediate commercial opportunity in existing and near-future industries.

[0004] Mobility in microgravity is difficult - whether on an asteroid or the exterior of a space station, moving from point A to point B is a challenge. Wheeled rovers are unsuitable to explore those locations that offer the greatest scientific and commercial opportunities. A new generation of robotic exploration systems is needed to characterise space resources, whether they be on asteroids or in craters on the Lunar South Pole.

[0005] A convergence of trends in the past few years have finally made walking robots commercially viable. The required technologies to create walking robots have individually existed for decades but have been too immature to combine into a commercially-viable walking robot. Despite prototypes having existed since the 1960s/70s, they were too limited in versatility, autonomy and battery life while also being too large and costly to deploy at scale.

[0006] These advances combine to make a robot like SCAR-E possible now, whereas it would've been impossible to build a robot of this size with a comparable performance even 5 years ago.

BRIEF SUMMARY OF INVENTION

[0007] We've created a free-climbing, space-capable hexapod designed for universal mobility anywhere with a solid interface. The Space Capable Autonomous Robotic Explorer (SCAR-E) is an autonomous hexapod robot with free-climbing capabilities, capable of carrying up to 5kg of payload in Earth-standard gravity and features a modular gripper system that can be configured with mission-specific attachments. allowing the robot to lock itself on the surface of an asteroid in microgravity and move freely as it carries out exploration activities. SCAR-E's six legs provide the best balance between mobility, size and performance.

[0008] It allows the robot to be secured on the surface while also being able to free one or two arms to conduct investigation and sampling activities. The robot is lightweight, currently weighing in at 15 kg, it natively has payload capabilities to accommodate scientific equipment for in-situ analysis. The symmetrical and reversible design choices enable wider motion capabilities while not constraining it to a specific direction of motion, and allowing it to recover from any unforeseen circumstances.

[0009] As well as being a keystone capability for future exploration missions, climbing robots have a range of industrial applications here on Earth. 3D mobility i.e. the ability to climb over sheer and inverted surfaces allows for automation of industrial tasks in hard-to-access and hazardous areas, while the robot's capabilities are designed for space they make it possible to carry out operations in the most extreme environments that our planet has to offer.

BRIEF DESCRIPTION OF DRAWINGS

[0010] Figure 1 provides the optimum viewpoint to illustrate the primary components of the robot - Gripper Attachment Point (1), Foot (2), Top Motor Cover (3), Bottom Motor Cover (4), Fully Invertable Movable Joint (5), Camera (6), Robot Cover (7), and Shoulder Joint (8).

[0011] Figure 2 provides a bottom-up image of the robot with legs fully extended. This view illustrates the Foot (2), Top Motor Cover (3), Fully Invertable Movable Joint (5), Camera (6), Robot Cover (7) and Shoulder Joint (8).

[0012] Figure 3 provides a head-on illustration for the front of the robot. This provides the optimum view for emphasis of the Gripper Attachment Point (1), Fully Invertable Movable Joint at (5), and placement of the Camera input at (6).

[0013] Figure 4 provides a top-down image of the robot with legs fully extended. This view provides the optimum viewpoint for the Top Motor Cover (3), Robot Cover (7) and Shoulder Joint (8).

[0014] Figure 5 provides a head-on image for the magnetic gripping attachment, illustrating the Attachment Point (2), Gripper Holder (3), Cover (4) and Power Lights (6).

[0015] Figure 6 provides a viewpoint of the magnetic gripper rotated 180 degrees from the illustration in Figure 5.

[0016] Figure 7 provides an offset overhead view for the magnetic gripper, highlighting the relative placement of the Attachment Point (2), Gripper Holder (3), and Power Lights (6).

[0017] Figure 8 provides the optimum viewpoint to illustrate all primary components of the magnetic gripper, with emphasis on the placement of the Magnet (1) and Rubber (5).

DETAILED DESCRIPTION

[0018] Robot configuration

The basic design of the robotic platform is a symmetric hexapod. Attached to the base are six legs which provide omnidirectional motion capabilities. Some key features of the design are listed below.

[0019] Full symmetry

Full symmetry in design means no obligation in directionality - robot can operate upside down Mammal inspired biomimetic robots are constrained by their directionality. We use radial symmetry to avoid this constraint.

[0020] Symmetrical leg configuration means one side fails, the other is still operational

Based on space research -> Turning motions are hard and cost energy radial symmetry means the robot is more flexible, failure safe.

[0021] Hexapedal configuration

Hexapedal configuration builds in redundancy into the movement system, providing the ability to use tool attachments instead of grippers for end effectors and offers flexibility in use cases and loadouts. Hexapedal configuration offers improved gait adaptability in general motion. Hexapedal offers best tradeoff between flexibility, stability, weight, speed and complexity relative to other configurations, for example, the dual use of legs as "arms" to manipulate objects, and the ability to attach mission-specific equipment onto high degree-of-freedom appendages widens possible missions robot can undertake

[0022] Design of architecture for modularity

RGB-D, LIDAR, internal sensors like temperature etc come as default, with the option to integrate additional sensor payloads into the robot via modular payload attachment capabilities. Built on Robotic Operating System (ROS), using ROS for system ensures modularity and ease integration of hardware (Hot-swappable grippers) and software components

[0023] Fully reversible joints

Without casing allows for a fully reversible, fully symmetrical design to ensure redundant operation in case of leg failure If the robot falls or tumbles it doesn't matter which way it lands: full reversibility prevents mission ending scenarios. Advanced ways for movement are possible (similar to a contortionist) - reversibility opens up possibilities for advanced gravity assisted motions. Advanced degrees of motions allow for a wider range of manoeuvres when moving over terrain with complex geometries

[0024] Locomotion software

Locomotion software built in-house specifically for SCAR-E's mechanical design
Biometics study used to optimise design choices and maximise capabilities

Mobility analysis based on all of the legs (reachable, movable, stability positions) fed into learning module.**[0025]**
On-board CPU Processing Recent Miniaturisation of CPUs enables these processes to be executed on-board

More power in a smaller volume given by powerful processors like the NVIDIA Orin AGX allows a robot of this size to be built with sufficient compute to run the software on-robot. RGB-D & LIDAR sensor fusion used for GPS denied SLAM is compute intensive, and would have rapidly drained the robot's battery when attempted on previous generations of processors.

[0026] Below is a list of some of the unique challenges that needed to be addressed, and how addressing them lead to the unique capabilities found in SCAR-E:

[0027] Microgravity has no down; every single direction can be treated as equivalent. Given the extreme terrain the robot is designed to operate in (See Fig 2) the need to consider simplifying plane transitions incentivised a robot design that emphasises symmetry, invertibility and high degrees of freedom of movement. SCAR-E's legs and cameras are symmetrically arranged around a hexagonal body, meaning there is no "forward" - it possible for the operator to move the robot into any direction of choice from rest

[0028] Symmetry and reversibility design choices were based on previous research into space robotics carried out by some of our team during their time as part of Google Lunar X Prize Team Hakuto. Research on wheeled robots & quadrupeds showed that the requirement to turn to change direction complicates motion, sensing and increases power usage. Radial symmetry and reversibility of the design simplifies moving, climbing and localisation & mapping.

[0029] In space, no one can set you upright: building reversibility into the design also prevents mission-ending unscheduled plane changes, with the joint configuration enabling SCAR-E to invert its legs and keep on walking if it is turned over. This also enables a much wider range of manoeuvres to be carried out to support locomotion in complex terrain such as the cleft seen in Fig 2.

[0030] The need to carry out autonomous operations far from home means that hot-swap capability is a requirement for a future asteroid mission. The robot has been designed to be able to hot-swap tools, with a modular attachment point enabling mission-specific end-effectors and grippers adapted for different surfaces to be swapped-in on the fly. To avoid constraining robot performance by carrying multiple built-in tools, even if they are not required for a particular mission, hot-swap capability allows operators of robots to change end-effectors/tools for the occasion without adding redundant mass to the robot..

[0031] Hydraulics & pneumatics do not work in space due to the need for working fluid. Only electric motors can be used. This allows a lower mass and a reduction in moving parts by removing the need to carry, use and temperature-control a working fluid.

[0032] High battery to overall mass ratio was needed to allow for multi-hour autonomy during extended operations in space. This large battery capacity allows for a large range of payloads to be mounted on and powered from the robot while it is in use for industrial applications here on Earth.

[0033] The need to cling to asteroid surfaces i.e. to rock-climb informed the choice to emphasise biomimetic design in limb motion, allowing SCAR-E to emulate limb mobility of insects and reptiles. Although not fast, SCAR-E is designed to be agile and flexible - this gives it an edge for industrial applications over mammalian biomimetic designs, especially when operations on vertical surfaces are required.

[0034] Shipping Applications

1. Shipbuilding (including drydocking repairs & maintenance) Quality Inspections:
- Weld seams inspections.
- Material quality control.
- Pipelines and cargo tanks/holds fitting quality control.
- Ships' virtual mapping/Digital twin.
- Digitalization of data collection and reporting.
- Incident prevention and management.

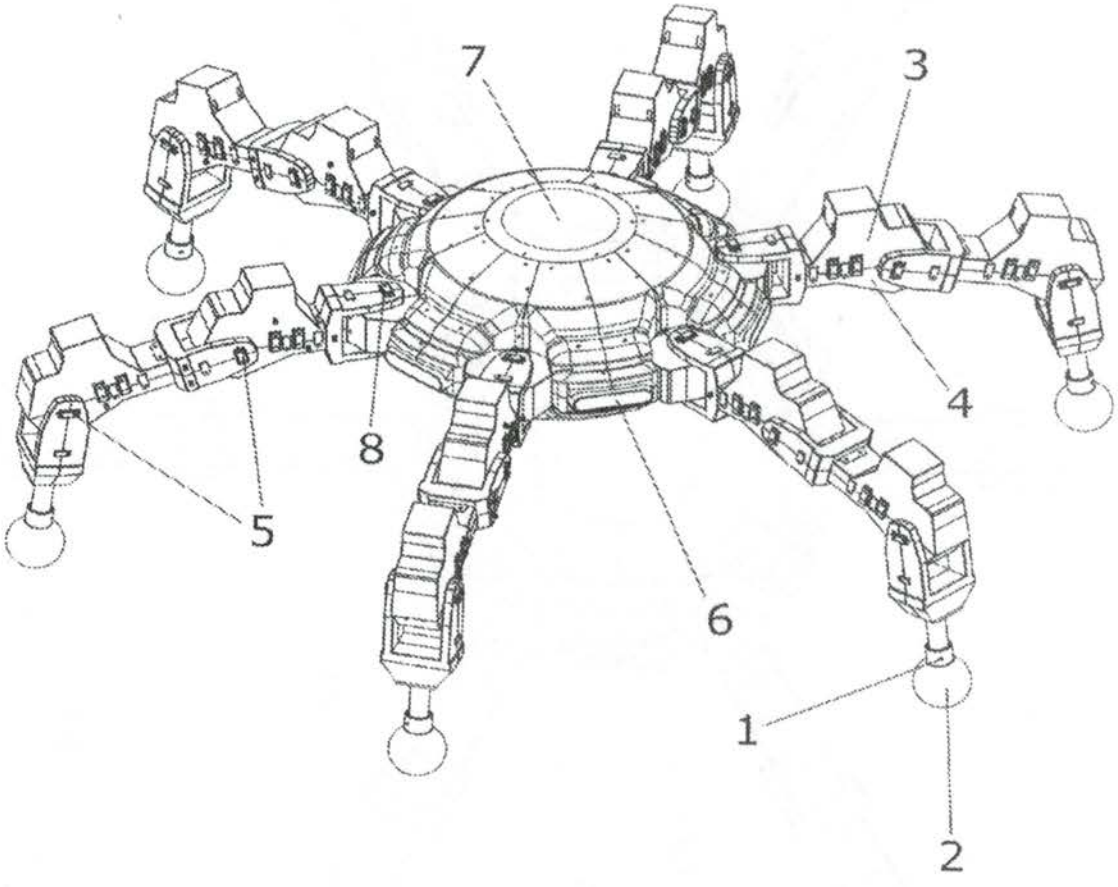
[0035] 2. Onboard/Vessel-in-Progress Inspections:

- Pipelines integrity and condition inspection.
- Cargo tanks/holds and hatches integrity and condition inspection.
- Bridge operational conditions (especially for ammonia and methanol carrying/fuelled vessels, where the gas diffusion must be monitored around the clock).
- Hull's soundness, damages, breaches inspection.
- Ship's condition reporting for drydocking maintenance and updating the digital twin.
- Incident prevention and Management.
- Digitalization of data and reports.
- In-progress cargo status inspection and reporting.

[0036] 3. Sea Ports Cargo Operations and Ship-to-Shore Interaction:

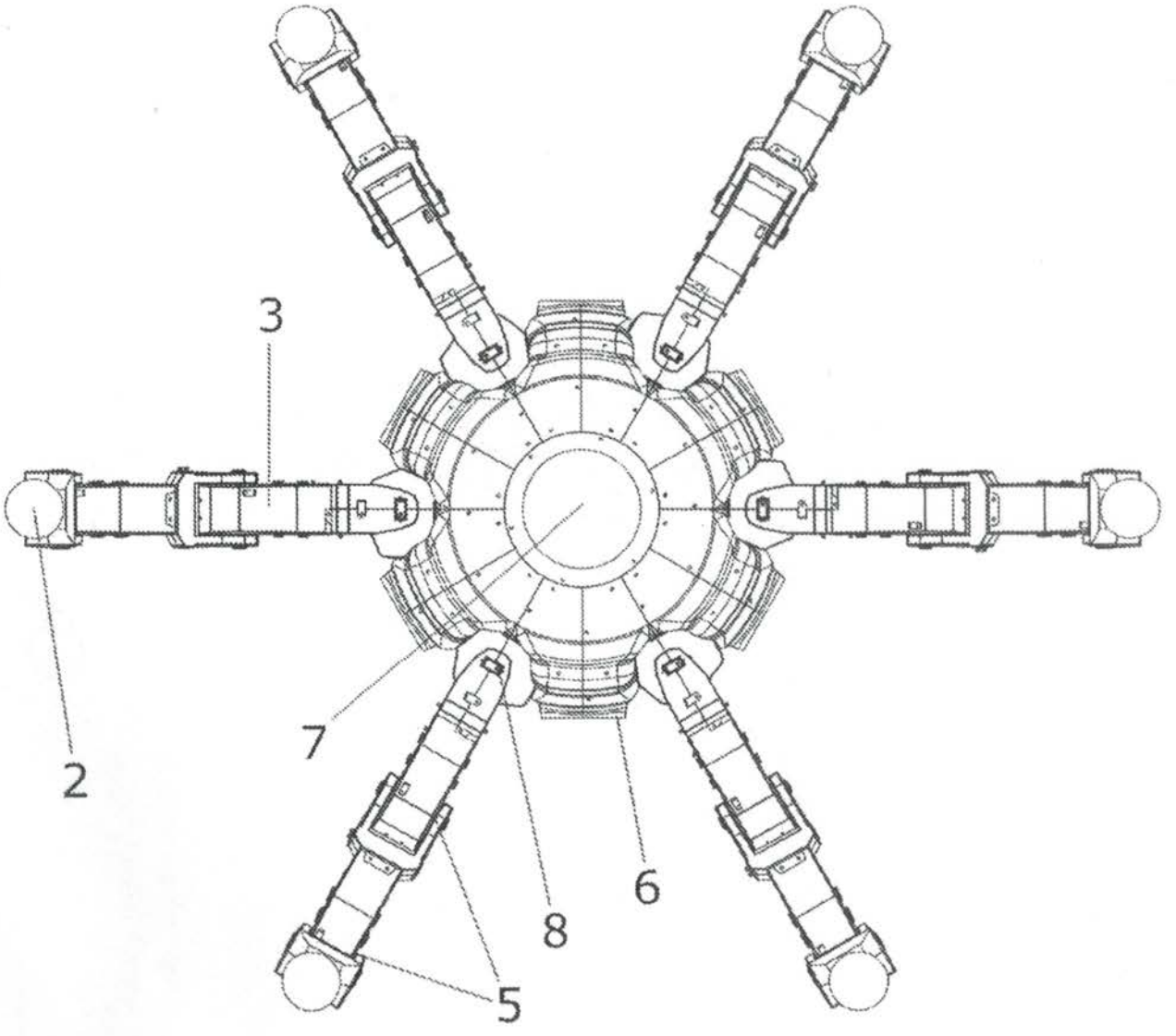
- Cargo tanks/storage terminals soundness and condition inspection.
- Cargo pipelines soundness and condition inspection.
- Territory surveillance, with particular focus on any spillages or faults that may give rise to hazardous incidents that are damaging to the environment and dangerous to human lives.
- Monitoring and reporting of the cargo operations (loading and discharge) simultaneously onboard the vessel and onshore.
- Accident prevention and management.
- Digitalization of data collection/reporting and operations.

FIGURE 1



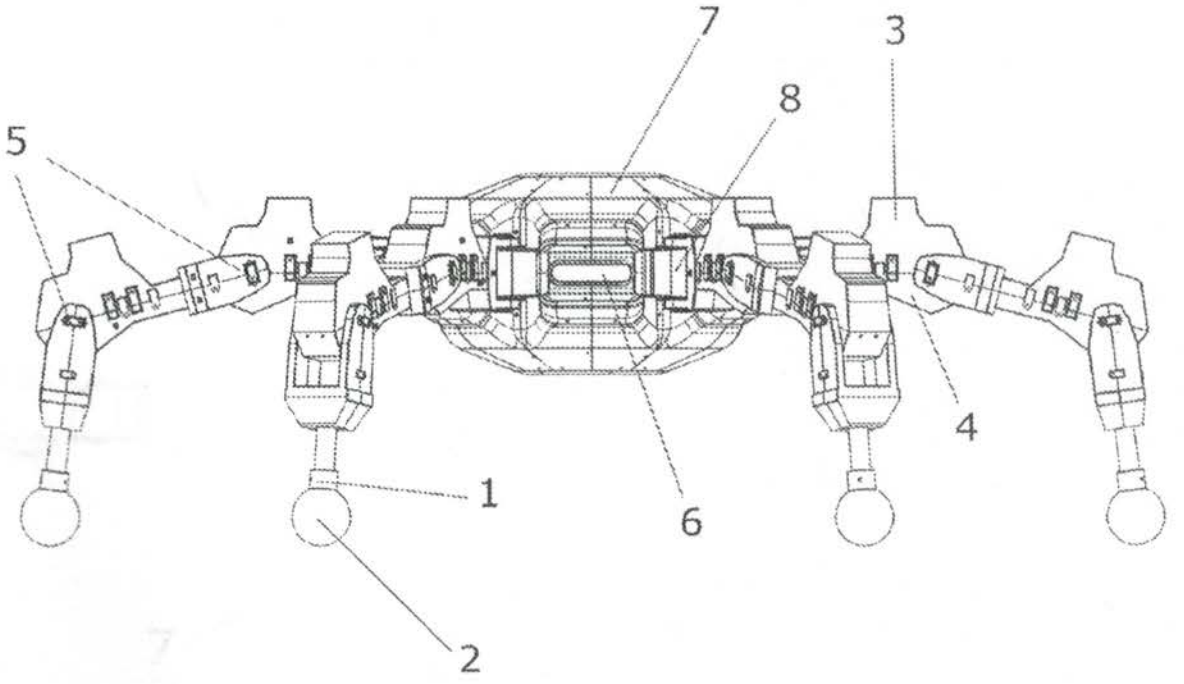
1 – Gripper Attachment Point
2 – Foot
3 – Top Motor Cover
4 – Bottom Motor Cover
5 – Fully Invertable Movable Joint
6 – Camera
7 – Robot Cover
8 – Shoulder Joint

FIGURE 2



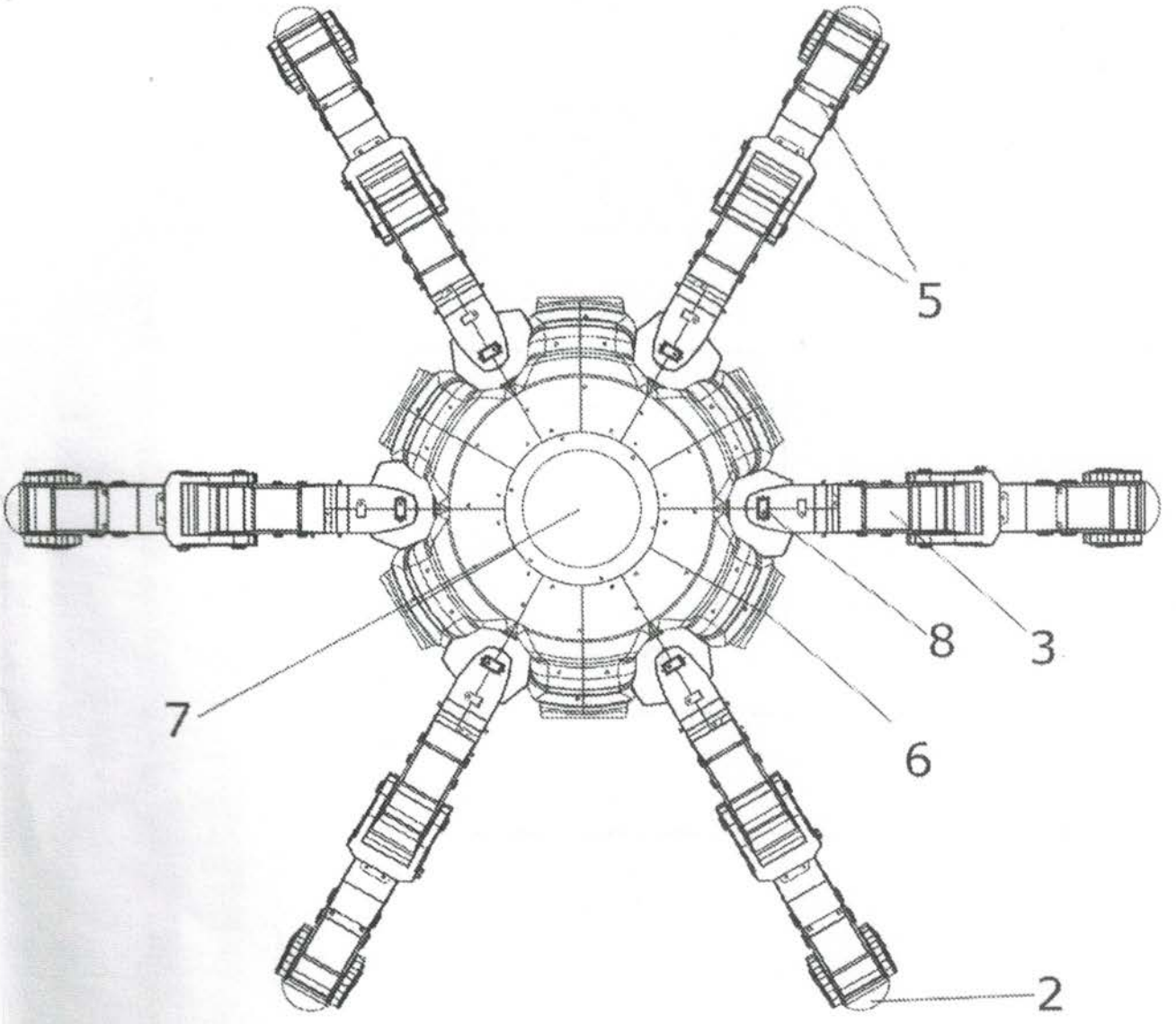
2 – Foot
3 – Top Motor Cover
5 – Fully Invertable Movable Joint
6 – Camera
7 – Robot Cover
8 – Shoulder Joint

FIGURE 3



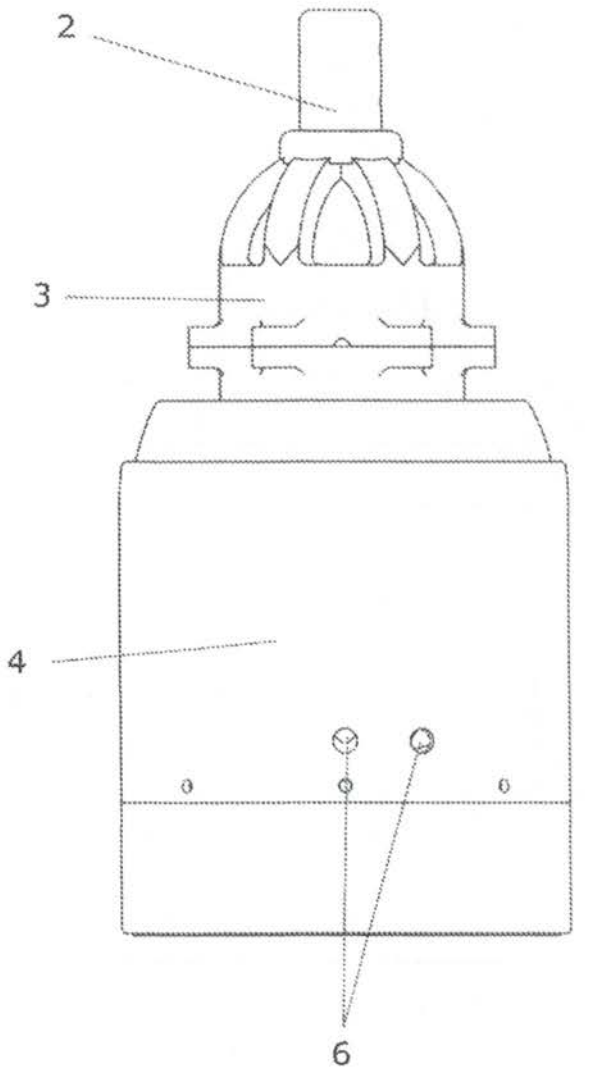
1 – Gripper Attachment Point
2 – Foot
3 – Top Motor Cover
4 – Bottom Motor Cover
5 – Fully Invertable Movable Joint
6 -- Camera
7 – Robot Cover
8 – Shoulder Joint

FIGURE 4



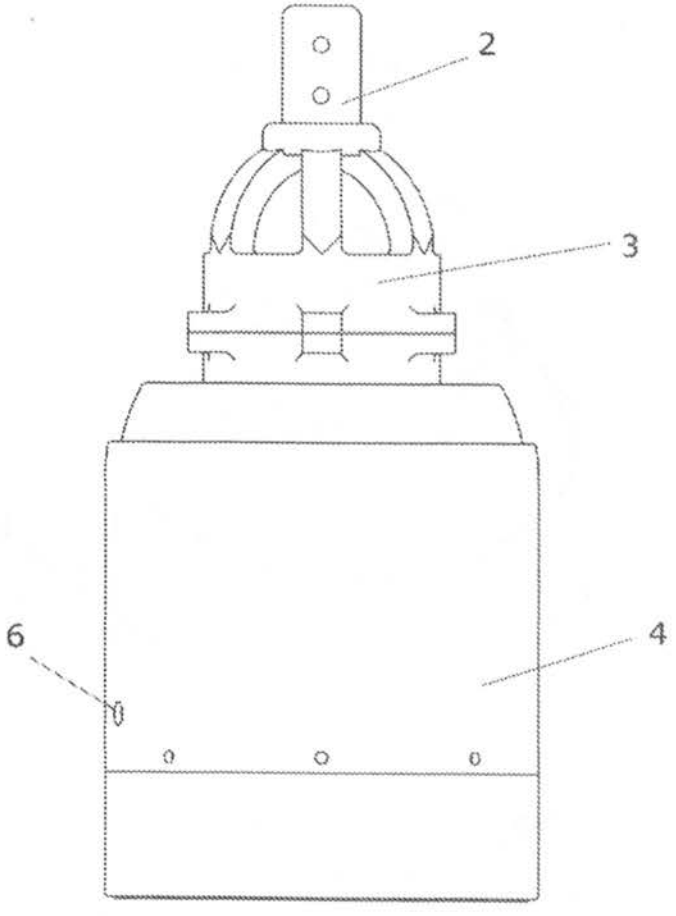
2 – Foot
3 – Top Motor Cover
4 – Bottom Motor Cover
5 – Fully Invertable Movable Joint
6 – Camera
7 – Robot Cover
8 – Shoulder Joint

FIGURE 5



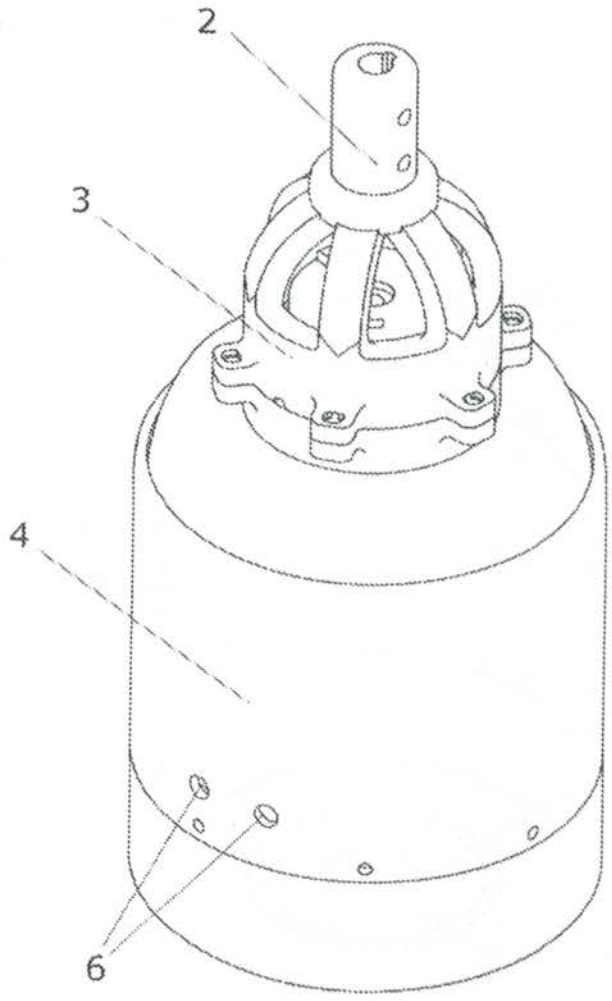
2 – Attachment Point
3 – Gripper Holder
4 – Cover
6 – Power Lights

FIGURE 6



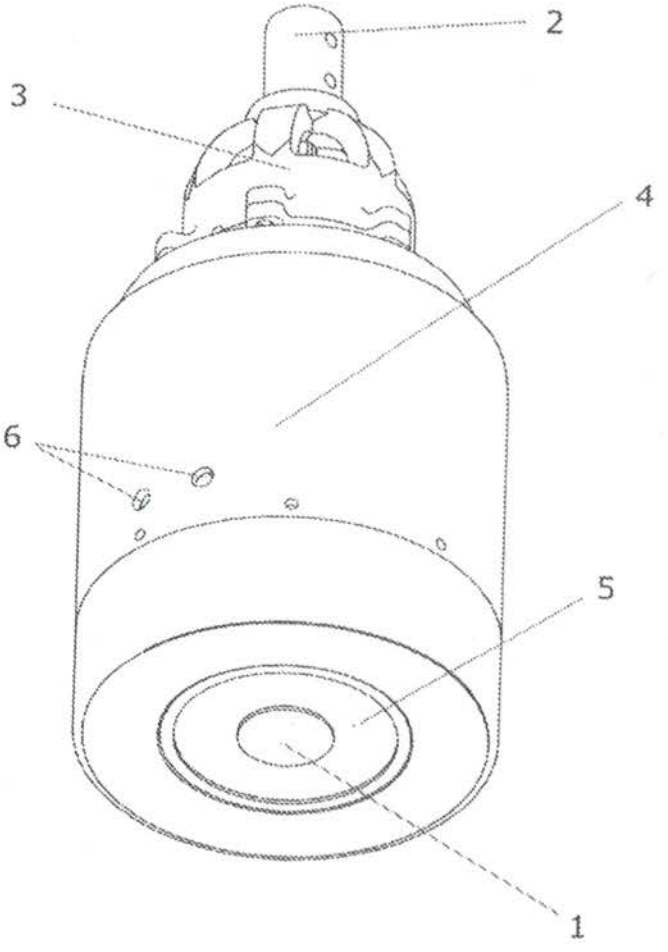
2 – Attachment Point
3 – Gripper Holder
4 -- Cover
6 – Power Lights

FIGURE 7



2 – Attachment Point
3 – Gripper Holder
4 – Cover
6 – Power Lights

FIGURE 8



1 – Magnet
2 – Attachment Point
3 – Gripper Holder
4 – Cover
5 – Rubber
6 – Power Lights

Application Data Sheet 37 CFR 1.76

The Application Data Sheet is part of the provisional or non-provisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.

Inventor Information

of inventors: 1

1. **Mickael Laine**

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JAPAN

Application Information

Customer number	---
Correspondence address	Charles Wesley Faires 2065 Country Ridge Road Milton, GA 30004 UNITED STATES
Title of invention	**Space Capable Autonomous Robotic Explorer**
Attorney docket number	---
Entity status	---

Application type	Provisional Application under 35 USC 111(b)
Subject matter	Utility
Total number of drawing sheets	8
Suggested figure for publication	---
Filing by reference	No

Representative Information

of representatives: 0

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).

Data was not provided for this section.

Domestic Benefit/National Stage Information

of benefit claims: 0

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c), 386(c), or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Data was not provided for this section.

Foreign Priority Information

of foreign priority claims: 0

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the Application Data Sheet constitutes the claim for priority as required by

35 U.S.C. 119 (b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Data was not provided for this section.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

Checking this box will cause the application to be examined under the first inventor to file provisions of the AIA.

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 2016, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization or Opt-Out of Authorization to Permit Access

When this Application Data Sheet is properly signed and filled with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE:
This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. **Priority Document Exchange (PDX)**
Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the China National Intellectual Property Administration (CNIPA), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a

bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h) (1).

B. **Search Results from U.S. Application to EPO**

Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☑ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☑ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with the search results from the instant application.

NOTE:

Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Applicant Information

of applicants: 1

The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46.

1. **Charles Wesley Faires**
2065 Country Ridge Road
Milton, GA 30004
UNITED STATES

Phone: 14044094468
Fax: ---
Email:
w.faires@asteroidminingcorporation.co.uk

Applicant: Individual
Applicant type: Person who shows sufficient proprietary interest

Assignee Information including Non-Applicant Assignee Information

of assignees: 1

bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h) (1).

B. **Search Results from U.S. Application to EPO**

Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☑ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☑ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with the search results from the instant application.

NOTE:

Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Applicant Information

of applicants: 1

The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46.

1. **Charles Wesley Faires**
2065 Country Ridge Road
Milton, GA 30004
UNITED STATES

Phone: 14044094468
Fax: ---
Email: w.faires@asteroidminingcorporation.co.uk

Applicant: Individual
Applicant type: Person who shows sufficient proprietary interest

Assignee Information including Non-Applicant Assignee Information

of assignees: 1

An assignee-applicant identified in the "Applicant" section will appear on the patent application as an applicant.

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Asteroid Mining Corporation, Ltd
150 Oakgate, Randalls Way
Leatherhead, ENG KT227RZ
UNITED KINGDOM

Organization

Signature

NOTE:

This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c)**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See CFR 1.4(d) for the manner of making signatures and certifications.

Signature	First name	Last name	Registration #	Date
/Mickael Laine/	Mickael	Laine	---	02/21/2025

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PATENT & TRADEMARK OFFICE